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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,901	07/24/2001	Larry Y. Yen	MCA-400 PC/U	3005

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EXAMINER	
MENON, KRISHNAN S	
ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,901	YEN ET AL.	
	Examiner	Art Unit	
	Krishnan S. Menon	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 29-57 are pending in the RCE of 3/31/05.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 49,50 and 52 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over EP 0 299 459 A2.

EP teaches an all perfluorinated thermoplastic hollow fiber membrane cartridge as in instant claims (see fig 5, page 4 lines 35-40, page 5 lines 36-49). Re method of making the cartridge, these claims are product by process, and "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Even though the reference teaches other thermoplastic materials as useful for making the cartridge (like polyethylene), the preferred material is all thermoplastic fluoropolymer (page 2 lines 32-39, page 4 lines

35-40, page 5 lines 43-48, working examples). The hollow fibers are made using a filler and pore-former, but such additives are completely extracted out leaving only thermoplastic fluoropolymer in the cartridge. EP'459 also teaches potting material as same or different from the material of the hollow fiber in page 7 line 25 – page 8 line 16. With regard to the melt temperature of the potting material, since this the melt temperature is for the purpose of making the hollow fiber bundle, and does not otherwise be a structural limitation, this limitation does not make the claim patentable. EP'459 also covers this limitation in the range of the softening point in page 7 lines 30-35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 54,55 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yagihashi et al (US 5,885,454) in view of EP 0 299 459 A2

Yagihashi teaches a method of forming a hollow fiber bundle by putting in parallel layers of thermoplastic hollow fibers over one or more strips of potting material, and winding the array in order to form the bundle, and then melting the potting strip to form the seal as claimed. (See abstract, col 4 lines 33-62, and figures 4A-F and 5).

Yagihashi teaches a variety of thermoplastic polymers and the corresponding potting strip in col 10 line 65 – col 11 line 8, but is not specific about the fluoropolymers. EP teaches such fluoropolymers and potting material that has a melting point below the melting point of the fiber material as claimed – see page 5 lines 36-48, page 4 lines 35-40; example 5 for all perfluorinated thermoplastic. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of EP in the teaching of Yagihashi to have the membrane cartridge for high temperature applications with low TOC in the filtrate as taught by EP (abstract and page 2).

Yagihashi also teaches the method as being for making fiber bundles with high packing density (col 3 lines 31-44), but does not specifically state the actual packing density as 45-65%. However, this would be inherent in the process since the applicant's process is the same, and the desired value for the packing density could be optimized based on the bundle-side flow, process fluids, and the cartridge flux requirements. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

3. Claims 29-48, 51,,53 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al (US 5,284,584) in view of EP 0 299 459 A2

Claim 29: Huang teaches a method of making a hollow fiber cartridge by making a bundle by laying parallel hollow fiber layers and laying a strip of the potting material in the molten form, the hollow fibers and the potting material all thermoplastics, and the melting point of the potting material being at least 5C below the melting point of the fiber material, and mounting the potted bundle in a housing and attaching the end-caps as claimed – see abstract, figures and col 4 lines 10-35. Melt index 100g/10 min – see col 4 lines 25-35. forming the potted bundle, cooling and then reheating the bundle – see col 14 lines 40-55.

Teaching of Huang differs from the claimed invention in the thermoplastic fluoropolymer. EP'459 teaches the thermoplastic fluoropolymers for the membrane cartridge. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of EP in the teaching of Huang because according to EP, the thermoplastic fluoropolymers have a higher thermal resistance than the thermoplastics used by Huang. See EP'459: page 2, page 5 lines 36-48, page 4 lines 35-40; and example 5 for all perfluorinated thermoplastic.

Claims 30-32: peak melting temperature of the potting material below that of the hollow fibers: see col 11 lines 20-32 of Huang and page 4 lines 35-40 and page 7 lines 25-58 of EP.

Claims 33 and 34: melt-flow index: Huang teaches 150 g/10 min – col 4 lines 25-35, and explains it in col 9 line 40 – col 10 line 34. This is an inherent property of the polymer used: The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent

teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

Claims 35 and 36: packing density: the process of Huang in view of EP would inherently produce the packing density as claimed. However, the desired value of the packing density could be optimized as explained in paragraph 2 above. In re Boesch and Slaney.

Claims 37 and 38: materials for the thermoplastic fluoropolymers are taught by EP: page 4 lines 35-40.

Claim 39: membrane array formed prior to potting – Huang col 4 lines 15-20 – membrane fabric.

Claims 40-43: thin streams of potting material on both, ends, spiral winding, and build-up of potting compound as claimed – Huang: figures, col 14.

Claim 44: cutting the potted end – Huang col 9 lines 1-6.

Claim 45. The bundle is mounted in said housing by fusion bonding (Huang-col 15 lines 4-8)

Claims 46-48: Huang teaches the method of making a hollow fiber membrane bundle by arranging the fibers parallely, winding about an axis parallel to the length of the fibers, and simultaneously applying the potting compound as a molten stream to an end of the bundle, cooling and then reheating to eliminate the voids as claimed – Huang

figures, col 13 line 60 – col 14 line 55. Melt-flow index and temperature of melting of the potting compound – col 4 lines 15-30. Exposing the ends of the lumen – col 9 lines 1-6.

Teaching of Huang differs from the claimed invention in the thermoplastic fluoropolymer. EP'459 teaches the thermoplastic fluoropolymers for the membrane cartridge. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of EP in the teaching of Huang because according to EP, the thermoplastic fluoropolymers have a higher thermal resistance than the thermoplastics used by Huang. See EP'459: page 2, page 5 lines 36-48, page 4 lines 35-40; and example 5 for all perfluorinated thermoplastic.

Claim 51: inserting the bundle in the housing, applying the first and second end-caps, providing shell-side access, etc – Huang figures and col 9 lines 7-40. Huang also teaches the means for sealing the end-caps to the housing and dividing the bundle into regions as claimed.

Claim 53: melt-flow index – inherent as explained under claims 33 and 34 above – in re Napier.

Claims 54-56: Huang teaches a method of making a hollow fiber bundle by laying parallel hollow fiber layers and laying a strip of the potting material in the molten form, the hollow fibers and the potting material all thermoplastics, and the melting point of the potting material being at least 5C below the melting point of the fiber material as claimed – see abstract, figures and col 4 lines 10-35.

Huang does not teach thermoplastic fluoropolymers as claimed. EP'459 teaches thermoplastic fluoropolymers. It would be obvious to one of ordinary skill in the art at

the time of invention to have the teaching of EP in the teaching of Huang because EP teaches that the fluoropolymers have a higher temperature resistance (page 2, page 5 lines 36-48, page 4 lines 35-40; example 5 for all perfluorinated thermoplastic).

Re the packing density of 45-65%, the process of Huang in vie of EP would inherently produce the packing density as claimed. However, the desired value of the packing density could be optimized as explained in paragraph 2 above. In re Boesch and Slaney.

Response to Arguments

There were no supporting arguments in the RCE of 3/31/05.

Conclusion

This action is in response to the RCE of 3/31/05, and is made non-final because of the new set of claims and the new grounds for rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan S. Menon
Patent Examiner
4/21/05

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